

Serial No. 09/889,078

RD-25877-9

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings of claims in the application:

1. (Currently Amended) A method of removing nitrogen-rich inclusions from a titanium containing electrode, comprising the steps of:
contacting a bottom surface of the titanium containing electrode with a flux in a crucible, wherein the flux comprises dissolved calcium metal;
passing a sufficient amount of electric current through the electrode and flux to melt the bottom surface of the electrode while resistively heating the flux at a temperature that melts the bottom of the electrode;
and dissolving the nitrogen-rich inclusions exposed to the flux by maintaining a nitrogen partial pressure in the flux lower than that in the inclusion.
2. (Original) A method according to claim 1 where the flux is a halide flux.
3. (Original) A method according to claim 2 where the halide flux is a calcium halide flux.
4. (Original) A method according to claim 3 where the calcium halide flux is calcium fluoride.
5. (Currently Amended) A method according to claim 2 where the halide flux contains dissolved ~~metals or oxides or metals and oxides~~.
6. (Cancelled)
7. (Currently Amended) A method according to claim 6 1, where the calcium metal is present in the flux in an amount of about 1 to 4.5 weight percent.

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8. (Original) A method according to claim 1 where the nitrogen-rich inclusion is a titanium nitride core surrounded successively by a layer of alpha-titanium and a layer of beta-titanium.
9. (Original) A method according to claim 1, where the flux is resistively heated at a temperature above about 1500 C.
10. (Original) A method according to claim 9 where the flux is heated above about 1650 C.
11. (Original) A method according to claim 1 where the electrode and flux are contained in a non-oxidizing environment.
12. (Original) A method according to claim 11 where the non-oxidizing environment is selected from the group consisting of argon, neon, helium, hydrogen, or mixtures thereof.
13. (Original) A method according to claim 1 where the flux is circulated past the inclusion by arc or magnetic stirring or both.
14. (Original) A method according to claim 1 where the partial pressure of nitrogen in the flux is between about 10-12 to 10-15 atmospheres.
15. (Original) A method according to claim 1 where the partial pressure of oxygen in the flux is about 10-20 to about 10-25.
16. (Original) An article made by the method of claim 1.
17. (Original) A method to refine titanium or titanium alloys by electroslag refining, comprising the steps of: heating in a non-oxidizing atmosphere a calcium halide flux containing about 1 - 4.5 weight percent calcium metal to a temperature above about

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1600 C; stirring the flux with a magnetic or arc stirring means; touching the flux with a titanium or titanium alloy electrode containing nitrogen-rich inclusions; applying an alternating current to the titanium or titanium alloy electrode, which passes through the flux to resistively heat the flux; and maintaining a partial pressure of nitrogen in the flux below the partial pressure of nitrogen in the flux below the partial pressure of nitrogen in the inclusion.